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YOU'RE THE BEST AROUND - HOW TTF BECAME A PREMIER NATURAL GAS TRADING HUB AND GLOBAL BENCHMARK

January 21, 2021

In the past few years, the Netherlands' Title Transfer Facility (TTF) overtook the UK's National Balancing Point (NBP) to become the premier gas trading hub in Europe. TTF has gained favor over NBP largely due to its location closer to more markets, supply pipelines, plentiful storage, and also the Netherlands' Gate LNG import terminal, which has become paramount given Europe's growing need for imported gas. As imports have grown, so has TTF in terms of its volume and its liquidity — a trend that is expected to continue as the European gas market evolves. TTF now shares the stage with Henry Hub and the Japan Korea Marker (JKM) as one of the key global benchmarks for LNG and natural gas. Though traders use TTF as a price index for LNG, much like its cross-Atlantic peer, Henry Hub, TTF is also heavily influenced by regional pipeline gas and storage levels. Today, we'll look at the history of Europe's premier natural gas index and the fundamentals affecting it.

LNG exports have fast become a major influence on U.S. natural gas market dynamics, and likewise, the global market is increasingly impacted by LNG exported from the U.S. As we've discussed often in the RBN blogosphere, including *An LNG Market for All Seasons*, the top two destination markets are consistently Europe and Asia. But while spot Asian LNG has increasingly been priced based on JKM, the price marker used for indexing LNG deliveries to Europe has recently been in flux.

Up until 15 years ago, the majority of European natural gas was indexed off of crude oil, often with multi-year arrangements. Using crude as an index provided the price certainty needed to attract buyers and sellers as market participants could tap into the advantages offered by a robust and well-documented crude futures market. But as the European gas market has evolved, it has been able to wean itself off oil indexing. In 2005, over 90% of European gas imports were indexed to oil. This figure declined to 60% by 2012, 40% by 2015, and to only 25% by 2019, according to data from the International Energy Agency (IEA). The ability of natural gas to trade independently from oil is a sign that the European gas market has matured and developed the mechanisms to allow for active trading and price discovery.

However, growth of the gas market varied within the European Union (EU). Markets in Northwest Europe, especially in countries such as the UK, France, the Netherlands, Belgium, and Germany established more rapidly than in other EU countries. The process of market creation commenced in the UK when the country decided to privatize and de-monopolize British Gas in the mid-1980s. This led to the 1996 formation of the National Balancing Point (NBP) price index, Europe's first natural gas trading hub. NBP was originally created to help shippers balance the amount of gas entering and leaving the UK's natural gas pipeline network — known as the national transmission system (NTS) — using the marketplace to create the price incentives and penalties that would get gas where it needed to go.

NBP is a virtual hub, which means that, rather than being tied to a specific location, the price is kept uniform across the NTS, and traders are not required to specify receipt and delivery locations within it. NBP quickly flourished and would remain the pre-eminent gas index in Europe for 20 years. It got a boost in 1998 with the opening of the Interconnector pipeline, which connected England to Belgium



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and, by extension, the rest of continental Europe. In addition, soon after its conception, the International Petroleum Exchange (IPE), which had already created and nurtured the prevalent Brent oil futures contract, started offering NBP futures. This attracted financial traders, whose participation increased trade volumes and liquidity. When IPE was purchased by Atlanta-based Intercontinental Exchange (ICE) in 2002, NBP had the backing of a rapidly growing American exchange with natural gas experience.

Across the channel in continental Europe, however, progress lagged. Efforts to deregulate and liberalize the European gas market did not start in earnest until the late 1990s, and it took a while for hubs to be formed. By 2005, when 40% of the UK's domestic and imported gas was indexed to traded natural gas (rather than oil), only a small fraction of continental Europe's deals were similarly linked to a natural gas price. Many transactions were indexed to NBP, but limited pipeline capacity between NBP and continental Europe meant that price dislocations and distortions could develop. Increased European imports of LNG helped to alleviate direct transportation constraints, but at that time, most LNG deals, from sources such as Nigeria and Algeria, were long-term, oil-indexed deals. By 2010, there was growing desire from continental European gas participants to foster a local hub. This desire was intensified by elevated oil prices that made oil-indexed gas prices notably higher than natural gas indices, which upset consumers and highlighted the disconnect between crude oil and natural gas fundamentals.

Enter TTF. It, along with a handful of other hubs in continental Europe, was created in the early 2000s but struggled to gain traction in the early years. Started in 2003, TTF is the trading hub of the Netherlands and was modeled off NBP. Like NBP, TTF is a virtual hub for marketing gas entering and exiting the country's gas transmission network. The government has been keen to advance and invest in the hub for economic benefits and security of supply. As shown in the map in Figure 1 below (originally published in the blog *The Space Between*), TTF is well connected to Germany and has pipeline access to much of Western and Northern Europe. In 2010, ICE added TTF futures to its platform. This has brought in more participants and thus increased trade volumes, liquidity, and price discovery. But there was a problem: domestic natural gas production from the Groningen field, located in northwest Netherlands, began declining, threatening TTF's future viability. And increased seismic activity has prompted the government to scale back production from the field, which is now expected to be phased out entirely by mid-2022. In 2011, the Gate LNG import terminal (green square in Figure 1), which ties directly into the gas transmission network of the Netherlands, was commissioned, giving LNG imports direct access to TTF.



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Figure 1. Simplified Western Europe Gas Flow Patterns and Hubs. Source: RBN

For almost a decade, TTF and NBP have been the leading gas trading hubs in Europe. At various times, over-the-counter (OTC; see our classic blog, *The Big Bang Theory*, for more on OTC deals) trading in TTF outpaced NBP even as NBP remained stronger through exchange trading on ICE. In terms of open interest on the ICE exchange, TTF pulled ahead of NBP in 2018 and has not looked back. In 2020, open interest on ICE futures was more than three times higher on TTF than on NBP. The NBP continues to be relevant and liquid, but its influence seems to be contracting back within the UK's borders. Since establishing itself as Europe's primary benchmark, more and more volume has gravitated towards TTF, helping it to grow in dominance.



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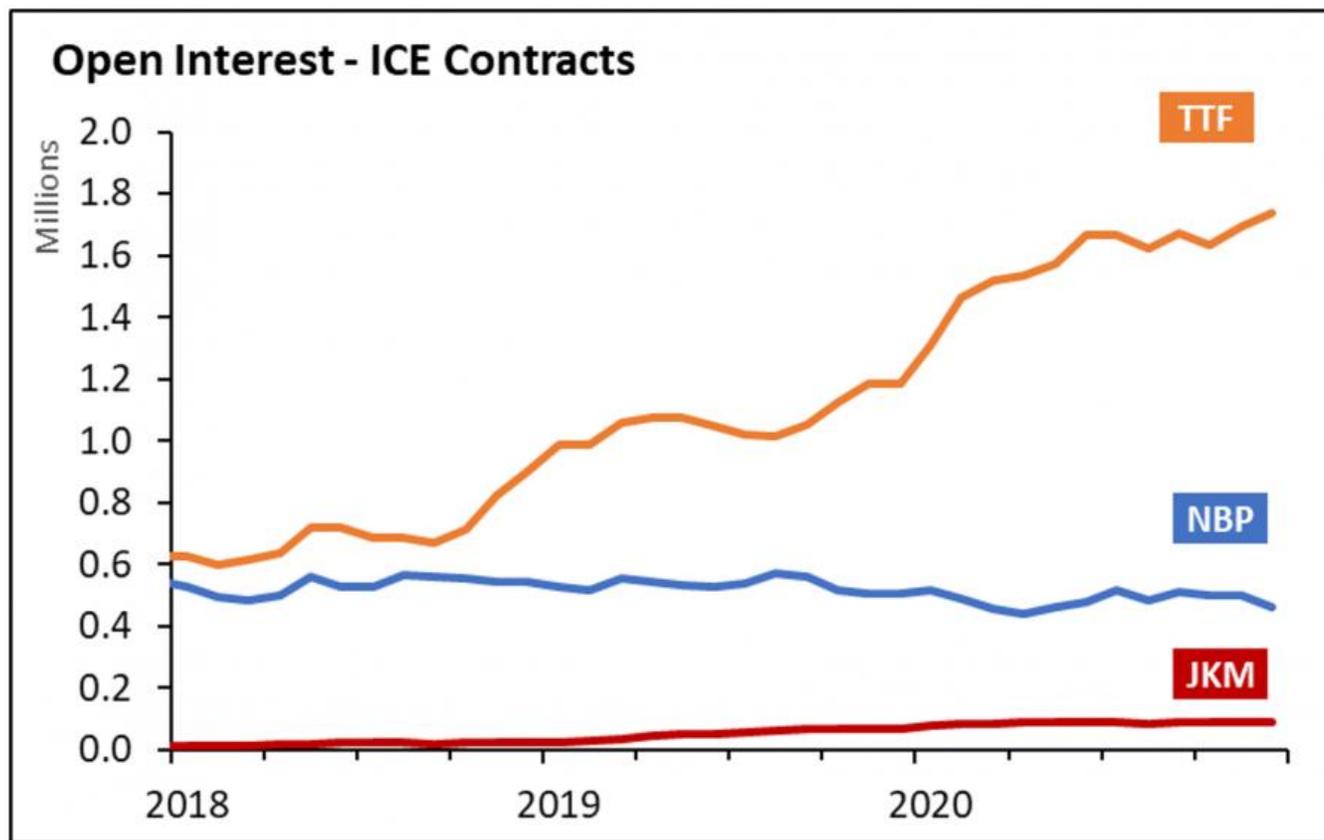


Figure 2. Open Interest – ICE Contracts. Source: ICE

Though the location of TTF is considered to be an import destination, while Henry Hub is an origination point for LNG exports, the hubs share similarities. Much like Henry Hub, TTF is influenced by pipeline gas and local storage, in addition to the price of local LNG. As we have noted in previous blogs, including the Henry the Hub, I Am I Am series and most recently in Riders on the Storm, the physical deliverability and flexibility of the hub is crucial, because it prevents market dislocations based on constrained supply or demand. And in this sense, TTF has several advantages, including its location near major consuming countries such as Germany and France and access to multiple pipeline networks. Another key advantage is access to ample amounts of storage. As in the U.S., storage in Europe is a critical component of the gas market, as it can act as a shock absorber for accommodating short-term shortages and surpluses. The Netherlands punches well above its weight with 490 Bcf of storage capacity, while nearby Germany has almost 800 Bcf (orange bars in Figure 3), with many of its facilities located near the Dutch border. These volumes dwarf the amount of storage in the UK, where capacity dwindled to 100 Bcf after the announced closure of the 30-year-old Rough storage facility in 2017. This closure occurred when the operator, Centrica, declined to make the investments necessary for continued operations, citing economic reasons.



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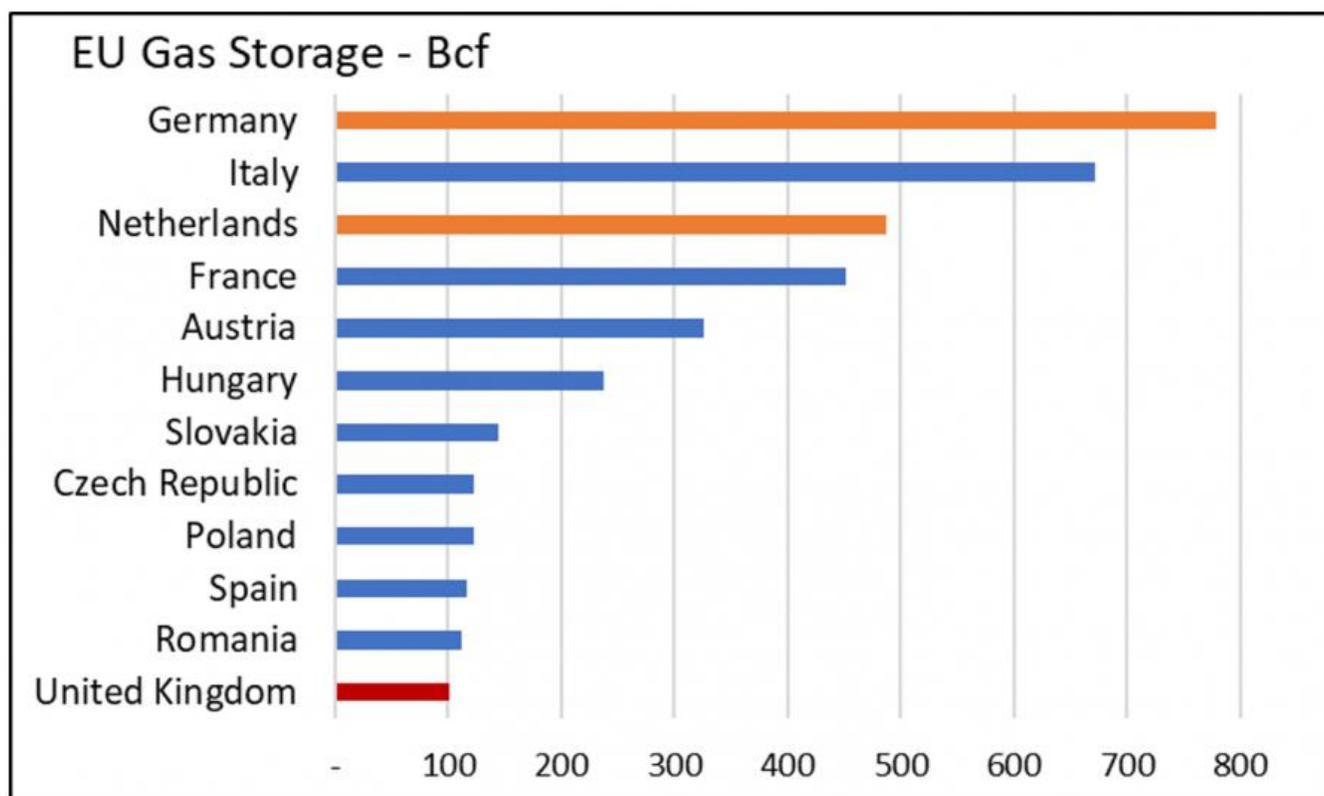


Figure 3. EU Gas Storage. Sources: Gas Infrastructure Europe and National Grid estimate for Great Britain

It appears that TTF's increasing liquidity and price transparency will continue to attract active participants throughout Western Europe. A dynamic and liquid gas price hub promotes a more efficient and reliable delivery of energy. From continental Europe's standpoint, it is the locations away from Northwest Europe and TTF, where there is a dearth of gas trading activity, that oil indexing remains commonplace.

Recently, TTF prices have increasingly reflected competition among suppliers delivering into Europe. In the non-winter months, when the pricing is favorable, European buyers buy LNG to help fill storage. In late May of 2020, low demand, high storage, and exceptionally cheap LNG pushed prompt TTF futures below \$1.20/MMBtu for the first time in its history. This incentivized pipeline importers to scale back. However, pipeline imports (mostly Russian) rebounded later last year as demand and prices increased. Direct imports into Europe from Russia increased on both an absolute and year-on-year basis from July to October 2020 as TTF prices increased from an average 5.36 Euro/MWh (\$1.80/MMBtu) to 14.18 Euro/MWh (\$4.90/MMBtu). Further, pipeline imports are expected to continue to grow, with additional potential imports from the Nord Stream 2 (though that pipeline has faced recent challenges) and other expansions. Russia and other exporters are eager to regain market share, and TTF is poised to be the epicenter of that battle. Incremental imports from Russia would impact LNG imports into Europe, which in turn would have a ripple effect for LNG activities around the world. Europe's role in absorbing U.S. LNG supplies and its interplay with the Asian markets is discussed in our recent blog, *You Spin Me Round*.



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The growth of TTF highlights the evolution of the European gas market, which no longer relies upon long-term, oil indexed contracts. European pricing is affected by gas-centric fundamentals, such as continental storage levels and pipeline imports that are more responsive to the TTF price. This is good news for European gas consumers in terms of price and reliability.

Note: The article was authored by Kent Bayazitoglu of Baker & O'Brien and published on RBN Energy's Daily Energy Post on January 21, 2021.

The music for "You're the Best Around" was written by Bill Conti, with lyrics by Allee Willis. The Conti-produced track, featuring vocals from Joe Esposito, was originally shopped to be the theme song for Rocky III, but was passed on in favor of "Eye of the Tiger" by Survivor. The Karate Kid's director, John Avildsen, who had worked with Conti before, liked the song and thought it would fit in perfectly in the 1984 movie. The song was featured in the climactic scene in the movie: an iconic montage where protagonist, Daniel LaRusso (Ralph Macchio) fights his way through the All-Valley Karate Championships. It appears as the 10th song on The Karate Kid: The Original Soundtrack album. It has gone on to be featured in over 20 television shows, and six other motion pictures.

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